Release Notes - AVR UC3 Software Framework

Release version: 1.6.0
Release date: 2009-12-15
AVR-UC3-SoftwareFramework-1.6.0.zip

This package supports:
- UC3 A0 and A1 devices revision H and later.
- UC3 B devices revision F and later.
- UC3 A3 devices revision E and later.
- UC3 A3xS devices revision E and later.
- UC3 C devices revision C.
- UC3 L devices revision B and later.

Supported tools:
- AVR32 GNU Toolchain (2.4) with GCC version: 4.3.2-atmel.1.0.1 (mingw32 special)

- AVR32 Studio version: 2.4

- IAR EWAVR32 v3.20A with updated header files (unzip the
  UTILS/AVR32_HEADER_FILES/AVR32_Header_Files.zip under <your IAR installation folder>/Embedded
  Workbench x.x/avr32/inc/).

- IAR EWAVR32 v3.21G with updated header files for UC3 C series (to update header files, unzip the
  UTILS/AVR32_HEADER_FILES/avr32-headers.zip under <your IAR installation folder>/Embedded
  Workbench x.x/avr32/inc/).

- IAR EWAVR32 v3.21F with updated header files for UC3 L series (to update header files, unzip the
  UTILS/AVR32_HEADER_FILES/avr32-headers.zip under <your IAR installation folder>/Embedded
  Workbench x.x/avr32/inc/).

1 Overview

The AVR® UC3 Software Framework consists of AVR UC3 microcontroller drivers, software services & libraries, and demonstration applications.

Each software module is provided with full source code, example of usage, rich html documentation and ready-to-use projects for the IAR EWAVR32 and GNU GCC compilers.

2 Downloading and Installing

The software can be found on the AVR Technical Library CD, or downloaded from Atmel's website at http://www.atmel.com/products/AVR32/ under the "Tools & Software" menu.

Unzip the package zip file (AVR-UC3-SoftwareFramework-x.x.x.zip) under a local folder on your PC. Open the \x.x.x-AT32UC3\readme.html file to browse through the documentation.

3 Contents

The following tables describe the availability of framework modules per AVR UC3 series.

APPLICATIONS	UC3A0 UC3A1	UC3A3	UC3A3S	UC3B	UC3C	UC3L
EVK1100-CONTROL-PANEL	X					
EVK1101-DEMO				X		
EVK1104-EVK1105-DSPLIB-DEMO		X				
EVK11xx_UC3B_VIRTUAL_COM_PORT				X		
AT32UC3C_EK_CAN_LIN_LOOPBACKS_DEMO					X	

BOARDS	UC3A0 UC3A1	UC3A3	UC3A3S	UC3B	UC3C	UC3L
EVK1100	X					
EVK1101				X		
EVK1104		X				
EVK1105	X					
STK600 / RCUC3L0						X
UC3C-EK					X	
UC3L-EK						X

DRIVERS	UC3A0 UC3A1	UC3A3	UC3A3S	UC3B	UC3C	UC3L
ABDAC	X	X	X	X		
ACIFA					X	
ACIFB						X
ADC	X	X	X	X		
ADCIFA					X	
ADCIFB						X
AES			X			
AST					X	X
CANIF					X	
CPU / CYCLE_COUNTER	X	X	X	X	X	X
CPU / MPU	X	X	X	X	X	X
CPU / SECURE_STATE						X
DMACA		X	X			
EBI	X	X	X		X	
ECCHRS		X	X			
EIC	X	X	X	X	X	X
FLASHC	X	X	X	X	X	
FLASHCDW						X
GPIO	X	X	X	X	X	X
HMATRIX	X	X	X	X	X	X
INTC	X	X	X	X	X	X
MACB	X					
MCI		X	X			
MDMA		X	X			
PDCA	X	X	X	X	X	X
PEVC					X	
PM	X	X	X	X	X	X
PWM	X	X	X	X	X	
PWMA						X

	UC3A0 UC3A1	UC3A3	UC3A3S	UC3B	UC3C	UC3L
QDEC					X	
RTC	X	X	X	X		
SCIF					X	X
SPI	X	X	X	X	X	X
SSC	X	X	X	X	X	
TC	X	X	X	X	X	X
TWI	X	X	X	X		
TWIM					X	X
TWIS					X	X
USART	X	X	X	X	X	X
USBB	X	X	X	X	X	
WDT	X	X	X	X	X	X

COMPONENTS	UC3A0 UC3A1	UC3A3	UC3A3S	UC3B	UC3C	UC3L
ACCELEROMETER / LIS3L06AL				X		
AUDIO / AMP / TPA6130A2	X		X	X		
AUDIO / CODEC / TLV320AIC23B	X		X	X		
AUDIO / DAC / PWM_DAC	X	X	X	X		
CLOCK_SYNTHESIZER\CIRRUS_LOGIC_CS2200-CP	X	X	X	X		
DISPLAY / DIP204	X					
DISPLAY / ET024006DHU	X	X	X		X	
JOYSTICK	X	X	X	X	X	
MEMORY / DATA_FLASH / AT25DFX	X	X	X	X	X	X
MEMORY / DATA_FLASH / AT45DBX	X	X	X	X	X	X
MEMORY / EEPROM / AT24CXX	X	X	X	X	X	X
MEMORY / NAND_FLASH /NAND_FLASH_EBI		X	X			
MEMORY / NAND_FLASH /NAND_FLASH_GPIO	X					
MEMORY / SD-MMC / MCI		X	X			
MEMORY / SD-MMC / SPI	X	X	X	X	X	X
MEMORY / SDRAM / MT48LC16M16A2TG7E	X	X	X		X	
TOUCH / QT1081	X	X	X	X	X	X
TOUCH / QT60168	X	X	X	X	X	X
TOUCH / RESISTIVE_TOUCH	X	X	X	X	X	
WIFI / HD	X	X	X	X		

SERVICES	UC3A0 UC3A1	UC3A3	UC3A3S	UC3B	UC3C	UC3L
AUDIO / AUDIO_MIXER	X	X	X	X	X	X
AUTOBAUD	X	X	X	X	X	X
DELAY	X	X	X	X	X	X
DSPLIB	X	X	X	X	X	X
FAT	X	X	X	X	X	X
FREERTOS	X	X	X	X	X	
LWIP	X	X	X	X		
MEMORY / CTRL_ACCESS	X	X	X	X	X	X
MEMORY / MEMORY_MANAGER / DLMALLOC	X	X	X	X	X	X
PICTURE / JPG	X	X	X			
POLARSSL	X	X	X	X	X	X
USB / CLASS / AUDIO	X	X	X	X		
USB / CLASS / CDC	X	X	X	X	X	

USB / CLASS / DFU	X	X	X	X	X	
USB / CLASS / HID	X	X	X	X	X	
USB / CLASS / MASS_STORAGE	X	X	X	X	X	

UTILS	UC3A0 UC3A1	UC3A3	UC3A3S	UC3B	UC3C	UC3L
AVR32_HEADER_FILES	X	X	X	X	X	X
DEBUG	X	X	X	X	X	X
LIBS / DRIVERS	X	X	X	X	X	X
LIBS / DSPLIB	X	X	X	X	X	X
LINKER_SCRIPTS	X	X	X	X	X	X
PREPROCESSOR	X	X	X	X	X	X
STARTUP_FILES	X	X	X	X	X	X

4 News

This section describes the changes between the 1.5.0 and the 1.6.0 releases.

4.1 New Features

- New UC3 C series support (revision C) and UC3C-EK support.
    - DRIVERS/ACIFA/: added new driver.
    - DRIVERS/ADCIFA/: added new driver.
    - DRIVERS/AST/: added new driver.
    - DRIVERS/CANIF/: added new driver.
    - DRIVERS/MDMA: added new driver.
    - DRIVERS/PEVC
    - DRIVERS/P: add new driver for UC3C.
    - DRIVERS/PWM: updated to support version 400 and higher
    - DRIVERS/QDEC
    - DRIVERS/SCIF: add new driver for UC3C.
    - DRIVERS/WDT: updated to support version 400 and higher
    -

- New UC3 C CAN and LIN application (APPLICATIONS/ AT32UC3C_EK_CAN_LIN_LOOPBACKS_DEMO), this application is loaded by default on UC3C-EK.

- Update UC3 L series (PWMA, ADCIFB) and UC3L-EK support.
    - DRIVERS/PWMA/: added new driver.
    - DRIVERS/ADCIFB/: added new driver.

- SERVICES/FREERTOS/: Import and merge FreeRTOS v6.0.0.

- SERVICES/USB/CLASS/AUDIO/: Update application and support new synchronization methods:
    - USB_RESYNC_METHOD_SOFT_ADD_DEL_SAMPLES: Add/remove samples on the fly.
    - USB_RESYNC_METHOD_SOFT_ADAPTIF_SRC: Pseudo adaptive Sampling Rate Conversion.
    - USB_RESYNC_METHOD_EXT_CLOCK_SYNTHESIZER: Use of an external clock synthesizer (e.g. the CL CS2200).
    This application is also described in a separate application note AVR32716 on www.atmel.com.

- \COMPONENTS\WIFI\HD: SDIO and SPI WIFI libraries upgraded to version v2.0.7 – support ATEXTWIFI add-on kit.
    V2.0.7 features:

- 802.11bg standard compliance.
- Commands are provided to demonstrate the following functions:
- scanning for access points
- setting 48 or 104 bit WEP keys
- associating with a chosen access point using WEP or Open System authentication
- WPA/WPA2/RSN with Pre-shared Key key distribution (WPA-Personal)
- Power save
- acquiring an IP address through DHCP
- ICMP echo client (ping)
- TTCP traffic generation
- a http server with dynamic content
- GUI for HTTP server
- Connection Manager

- \SERVICES\LWIP\lwip-port-1.3.0\HD updated to support latest WIFI H&D stack v2.0.7

- SERVICES/DSPLIB/: added a new API in the re-sampling module. This API is used to link a stream previously re-sampled using a re-sampling   structure with a new re-sampling structure. This is used to keep the continuity with two pieces of a stream re-sampled using two different re-sampling parameters.

- \SERVICES\LIN: add new LIN network services.

- Added "How do I include a binary file into my source code" entry in the FAQ documentation.

- SERVICES/USB/CLASS/CDC/:
  Add USB CDC Device in high speed configuration.
  Add demo CDC Device UART bridge.

- SERVICES/USB/CLASS/AUDIO/EXAMPLES/EXAMPLE2/: Add microphone support.

- DRIVERS/USBB/:
  Add double bank on USB Host Bulk endpoints.
  Enable Ping on USB Host High Speed.

- COMPONENTS/CLOCK_SYNTHESIZER/CIRRUS_LOGIC_CS2200-CP/: new driver on for the Cirrus clock synthesizer CS2200.

- DRIVERS/SCIF/EXAMPLE3_UC3L/: added new example about OSC32K and generic clock configuration and static sleep mode.

- COMPONENTS\TOUCH\RESISTIVE_TOUCH\EXAMPLE: new resistive touch display driver.

4.2 Notable Bug Fixes and Improvements

In addition to these fixes, the documentation has been improved and updated.

- DRIVERS/GPIO/LOCAL_BUS_EXAMPLE/: for AT32UC3L devices, use of power_clocks_lib::pcl_configure_clocks() instead of a local implementation.

- DRIVERS/SCIF/scif_uc3l.h:
  # Adds the field extosc_f to the structure scif_gclk_opt_t
  # Adds 'L' to the value of the following defines: SCIF_DFLL_MINFREQ_HZ, SCIF_DFLL_MAXFREQ_HZ, SCIF_RC120M_FREQ_HZ
  # scif_dfll0_ssg_gc_enable(): interface change (add the scif_gclk_opt_t

settings structure) and preprocessor-map to scif_start_gclk()
     # scif_dfll0_closedloop_configure_and_start(): interface change (use the
      scif_gclk_opt_t settings structure instead of scif_gcctrl_oscsel_t)
     # scif_dfll0_closedloop_dither_gc_enable(): interface change (add the
      scif_gclk_opt_t settings structure).

- DRIVERS/SCIF/scif_uc3l.c::scif_dfll0_closedloop_configure_and_start():implementation change due
  to the interface change.

- DRIVERS/PM/power_clocks_lib.h: Add the field pextra_params to the pcl_freq_param_t structure.

- DRIVERS/PM/power_clocks_lib.c::pcl_configure_clocks_dfll0(): implementation change to process the
  new field in the pcl_freq_param_t structure and to adapt to the
  scif_dfll0_closedloop_configure_and_start() change of interface.

- COMPONENTS/MEMORY/DATA_FLASH/AT45DBX/EXAMPLE/at45dbx_example.c,
  DRIVERS/ADCIFB/EXAMPLE1/adcifb_example1.c,
  DRIVERS/CPU/CYCLE_COUNTER/EXAMPLE/cycle_counter_example.c,
  DRIVERS/FLASHCDW/FLASH_EXAMPLE/flash_example.c,
  DRIVERS/INTC/EXAMPLE/interrupt_usart_example.c,
  DRIVERS/PDCA/EXAMPLE/pdca_example.c, DRIVERS/TC/EXAMPLE1/tc_example1.c,
  DRIVERS/TC/EXAMPLE2/tc_example2.c, DRIVERS/TC/EXAMPLE3/tc_example3.c,
  DRIVERS/TC/EXAMPLE4_UC3L/tc_event_example4_uc3l.c,
- DRIVERS/USART/USART_EXAMPLE/usart_example.c: add the new parameter field in the
  pcl_freq_param_t structure that defines the configuration of the generic clock used by the DFLL.

- \SERVICES\USB\CLASS\DFU\EXAMPLES\ISP: Update GCC projects config.mk, the option -Wl,--
  direct-data is added for the linker configuration.

- DRIVERS/FLASHCDW/flashcdw.c: flashcdw_memset() & flashcdw_memcpy() fixes according to
  FLASHCDW write requirements (cf UC3L datasheet sub-section "Page Buffer Operations").

- DRIVERS/SCIF/scif_uc3l.h,scif_uc3l.c,scif_uc3c.h,
  DRIVERS/SCIF/EXAMPLE3_UC3L/scif_example3.c,
  DRIVERS/PEVC/EXAMPLE2/pevc_example2.c,
  COMPONENTS/MEMORY/DATA_FLASH/AT45DBX/EXAMPLE/at45dbx_example.c: in enum
  scif_gcctrl_oscsel_t, rename SCIF_GCCTRL_CLK32 to SCIF_GCCTRL_OSC32.

- DRIVERS/SCIF/scif_uc3l.h:
     # removed the enum scif_dfll_clkref_t and replaced by the use of the enum scif_gcctrl_oscsel_t
     # updated the enum scif_osc_mode_t for UC3L revC and later compliance
(SCIF_OSC_MODE_1PIN_CRYSTAL removed).

- DRIVERS/SCIF/scif_uc3l.c::scif_dfll0_closedloop_configure_and_start(),
  DRIVERS/SCIF/EXAMPLE3_UC3L/scif_example3.c,
  DRIVERS/PM/power_clocks_lib.c::pcl_configure_clocks_dfll0(),
  COMPONENTS/MEMORY/DATA_FLASH/AT45DBX/EXAMPLE/at45dbx_example.c: use of
  the enum scif_gcctrl_oscsel_t instead of the removed enum scif_dfll_clkref_t.

- DRIVERS/SCIF/scif_uc3l.h,scif_uc3l.c: add the scif_disable_rc32out() function.

- DRIVERS/SCIF/scif_uc3l.c::scif_start_osc32():
     # add a call to scif_disable_rc32out() for UC3L revC or later
     # unlock the OSCCTRL32 register for UC3L revC or later.

- APPLICATIONS/EVK1100-CONTROL-PANEL/LOCALCTRL/cptime.c::
  e_cptime_RecordScheduledCmd(): removed a compiler warning.

- COMPONENTS/DISPLAY/DIP204/: Remove the _ASSERT_ENABLE_ from the top of the file. If
  needed, assert has to be enabled by editing the config.mk of the application.
- COMPONENTS/DISPLAY/ET024006DHU/: Fix bad assert().

- DRIVERS/FLASHCDW/FLASH_EXAMPLE/: fixed the local IAR linker scripts.

- DRIVERS/USBB/ENUM/DEVICE/: Ensure Chapter 9 compliance for audio and HID devices.

- BOARDS/UC3L_EK/uc3l_ek.h: added the battery signal VBAT connection to the UC3L.

- SERVICES/DSPLIB/GENERIC/BASIC/VECTORS/vect_dsp32_complex_abs.c: change the data type
  used for internal calculations from S32 to S64. This lead to overflowing values and therefore to a wrong
  result.

- BOARDS/UC3L_EK/uc3l_ek.h: added preprocessor switches on UC3L_EK_REV1 to switch between
  rev1 and rev2 of the AT32UC3L-EK board.

- GCC and IAR projects in
  DRIVERS/CPU/CYCLE_COUNTER/EXAMPLE/AT32UC3L064_UC3L_EK/,
  DRIVERS/CPU/SECURE_STATE/BASIC_EXAMPLE/AT32UC3L064_UC3L_EK/,
  DRIVERS/SCIF/EXAMPLE3_UC3L/: Define the UC3L_EK_REV1 define. Other
unmodified AT32UC3L064_UC3L_EK projects are not impacted by the difference between rev1 and rev2 of
the board.

- SERVICES/USB/CLASS/MASS_STORAGE/EXAMPLES/:
  APPLICATIONS/EVK1104-DEMO/:
  Fix USB dialog when USB MSC HS device is running with CPU clock at 12MHz.

- All: Set all UNLOCK/WRITE actions between
  AVR32_ENTER_CRITICAL_REGION()/AVR32_LEAVE_CRITICAL_REGION().

- UTILS/compiler.h: Save code size by removing an unnecessary test from the
  AVR32_ENTER_CRITICAL_REGION() macro.

- SERVICES/AUDIO/AUDIO_PLAYERS/PLAYERS/USB/: Ensures a good startup of the audio stream
  by giving to the PDCA a reload buffer during the synchronization.

- DRIVERS/HMATRIX/hmatrix.h: test if CPU_TYPE is defined before its value.

- DRIVERS/PDCA/EXAMPLE/: removed inclusion of hmatrix.h

- BOARDS/UC3L_EK/uc3l_ek.h : introduction of the evaluation kit rev1 and rev2 differences by using
  the UC3L_EK_REV1 and UC3L_EK_REV2 defines.

- DRIVERS/FLASHCDW/flashcdw.c: change implementation of
  flashcdw_set_flash_waitstate_and_readmode().

- DRIVERS/FLASHCDW/FLASH_EXAMPLE/: port to AT32UC3L-EK.

- DRIVERS/GPIO_LOCAL_BUS_EXAMPLE/: add missing call to
  flashcdw_set_flash_waitstate_and_readmode() and port to AT32UC3L-EK.

- DRIVERS/INTC/EXAMPLE/: port to AT32UC3L-EK.

- DRIVERS/PDCA_EXAMPLE/: port to AT32UC3L-EK.

- DRIVERS/PM/EXAMPLE2/: add missing call to flashcdw_set_flash_waitstate_and_readmode().

- DRIVERS/PM/power_clocks_lib.c: in pcl_switch_to_osc(), add missing call to flashcdw_set_flash_waitstate_and_readmode().

- DRIVERS/TC/EXAMPLE1/, DRIVERS/TC/EXAMPLE2/, DRIVERS/TC/EXAMPLE3/, DRIVERS/TC/EXAMPLE4_UC3L/: port to AT32UC3L-EK.

- DRIVERS/GPIO/: added support of Pull-up Resistor, Pull-down Resistor and Buskeeper Control introduced in the GPIO version 2.0.0.

- SERVICES/DSPLIB/: added more documentation on the preconditions required before using the FFT functions.

- DRIVERS/CPU/CYCLE_COUNTER/EXAMPLE/AT32UC3*/GCC/config.mk: removed unnecessary link to Newlib addons.

- DRIVERS/INTC/intc.c: added init of AVR32_EVBA to _evba in INTC_init_interrupts().

- DRIVERS/EIC/eic.h: fix EXT_INT0 and EXT_NMI defines value.

- SERVICES\USB\CLASS\DFU\EXAMPLES\ISP\ENUM\DEVICE\:
    - usb_descriptors.h: Added the bootloader revision in the USB_PRODUCT_NAME and set SN_INDEX to 0.
    - usb_specific_request.c: do not return a serial number if SN_INDEX is 0.

- DRIVERS/ACIFB/acifb.c, DRIVERS/FLASHCDW/flashcdw.h, DRIVERS/GPIO/gpio.c,.h, DRIVERS/PM/pm_uc3l.c, DRIVERS/SCIF/scif_uc3l.c,.h:Fixes to comply with the new UC3L revD header files.

4.3 Known Bugs and Limitations

- Some software modules do not provide EXAMPLE subdirectories (e.g. /DRIVERS/SPI/).

- The header files of the Software modules are not C++-ready.

- The AVR32Studio Managed Make tutorial does not work if it is loaded with the USB DFU bootloader.

- DRIVERS/ABDAC: the software driver and the example are poorly documented.

- APPLICATIONS\EVK11xx_UC3B_VIRTUAL_COM_PORT and \SERVICES\USB\CLASS\CDC: Some characters may be dropped using Linux and CDC ACM driver.

- UTILS/NEWLIB_ADDONS/cpu.c: The udelay() function does only work if the CPU frequency is equal to the PBA frequency.

5 Contact Information

For support on the UC3 Software Framework please see http://support.atmel.no/.
Users of the AVR UC3 Software Framework are also welcome to discuss on the AVRFreaks website (http://www.avrfreaks.net/) forum for AVR32 Software Tools.